

Cobia bycatch on the VIMS elasmobranch longline survey:1989-2011

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Summary

The Virginia Institute of Marine Science (VIMS) has conducted a fishery-independent longline survey during summer months since 1974. The VIMS longline survey was designed to sample coastal and estuarine elasmobranch populations, however large finfish such as cobia are occasional bycatch on demersal gear. Data for cobia bycatch on the VIMS longline survey are presented. Cobia bycatch was absent in some years, and peaked in 1996 with ten individuals. Maturity data from earlier studies suggest that all but two measured cobia were mature.

Materials and Methods

The VIMS Elasmobranch Longline Survey is a station-oriented field survey of the Chesapeake Bay and coastal waters from Cape Hatteras, NC to Cape Henlopen, DE with most effort taking place in Virginia waters (Figure 1). Gear used was the standard for the commercial longline industry at the beginning of the VIMS program in 1974. Gear characteristics have remained constant throughout. We used commercial-style longlines consisting of 4.8 mm tarred, nylon mainline that was anchored at each end and marked by radar-reflective high fliers. Gangions 3 m in length were spaced approximately 18 m apart along the mainline and a large buoy was attached to the mainline following every 20th gangion. Standard gangions were composed of a stainless-steel tuna clip attached to a 2 m section of 3.2 mm tarred nylon line, the end of which was attached to an 8/0 barrel swivel. We crimped one end of a 1 m section of 1.6 mm stainless steel aircraft cable to the swivel and the other end to a Mustad 9/0 J-hook. All stations are in water depths between five and 30 m, and nearly all gangions rest on the bottom during a set. Bait consisted of various coastal teleosts including Atlantic menhaden (*Brevoortia tyrannus*) and Atlantic mackerel (*Scomber scombrus*) until 2008, from which time all hooks were baited with Atlantic menhaden only. A standard set consisted of 100 hooks and was approximately 2 km in length. Standard soak time was four hours. Data recorded for each set included 1) location, 2) start and finish times for setting and hauling, 3) maximum and minimum water depth, 4) surface and bottom water temperature, 5) number of hooks and hook type, 6) bait species. Beginning in 1996, hydrographic conditions including water temperature, dissolved oxygen, and salinity were recorded from surface to the bottom at 2 m depth intervals.

The VIMS Elasmobranch Research Program also used modified longline gear to monitor juvenile elasmobranch populations in the lower eastern Chesapeake Bay. Bay longline gear consisted of 4.8 mm tarred nylon mainline with 80 9/0 Mustad J hook standard gangions and 40 12/0 Mustad circle hook "puppy" gangions, composed of 3 m monofilament line (1.6 mm). Soak time, bait, and configuration otherwise reflected standard gear.

Fork length, stretch total length, weight, and fish sex were sporadically reported for cobia bycatch. Cobia landed in good condition were released alive. Since bycatch have not always been a survey priority, cobia data collection was often voluntary and therefore inconsistent. Consequently, inferring population level trends from these data (e.g. abundance indices) is not appropriate.

Results

The VIMS Elasmobranch Longline Survey database contains 57 records for cobia bycatch since 1989. Cobia were sampled in both ocean (n = 19) and estuarine (n = 38) habitats (Figure 1), and were captured on Mustad 9/0 J hooks (n = 48) or 12/0 circle hooks (n = 9) during summer months between May and October. A 1:1 sex ratio was observed in the 18 cobia for which sex was determined. Peak cobia bycatch (n = 10) occurred in 1996 and has since declined.

We plotted fork (FL) and total (TL) length-weight relationships for all measured cobia (Figure 2). Mean lengths and weight (\pm SD) of fish sampled were 1052.15 \pm 235.11 mm FL (n = 37), 1226.18 \pm 224.61 mm TL (n = 34), and 53.08 \pm 36.64 kg (n = 16). Maturity of cobia from Chesapeake Bay and adjacent Virginia waters has been observed in age two male cobia and age three female cobia with FL 518 mm and 696 mm, respectively (Richards 1967). More recent studies suggest that, in general, sexual maturity is reached in males >650 mm and females >800 mm FL (Franks and Brown-Peterson 2002). Data from the VIMS Elasmobranch Longline Survey indicated that 95% of measured cobia were likely sexually mature.

References

- Franks, J.S. and N.J. Brown-Peterson. 2002. A review: age, growth and reproduction of cobia, *Rachycentron canadum*, from U.S. waters of the Gulf of Mexico and south Atlantic Ocean. Proceedings of the Gulf and Caribbean Fisheries Institute 53: 553-569.
- Richards, C.E. 1967. Age, growth and fecundity of the cobia, *Rachycentron canadum*, from Chesapeake Bay and adjacent mid-Atlantic waters. Transactions of the American Fisheries Society 96:3, 343-350.

Tables and Figures

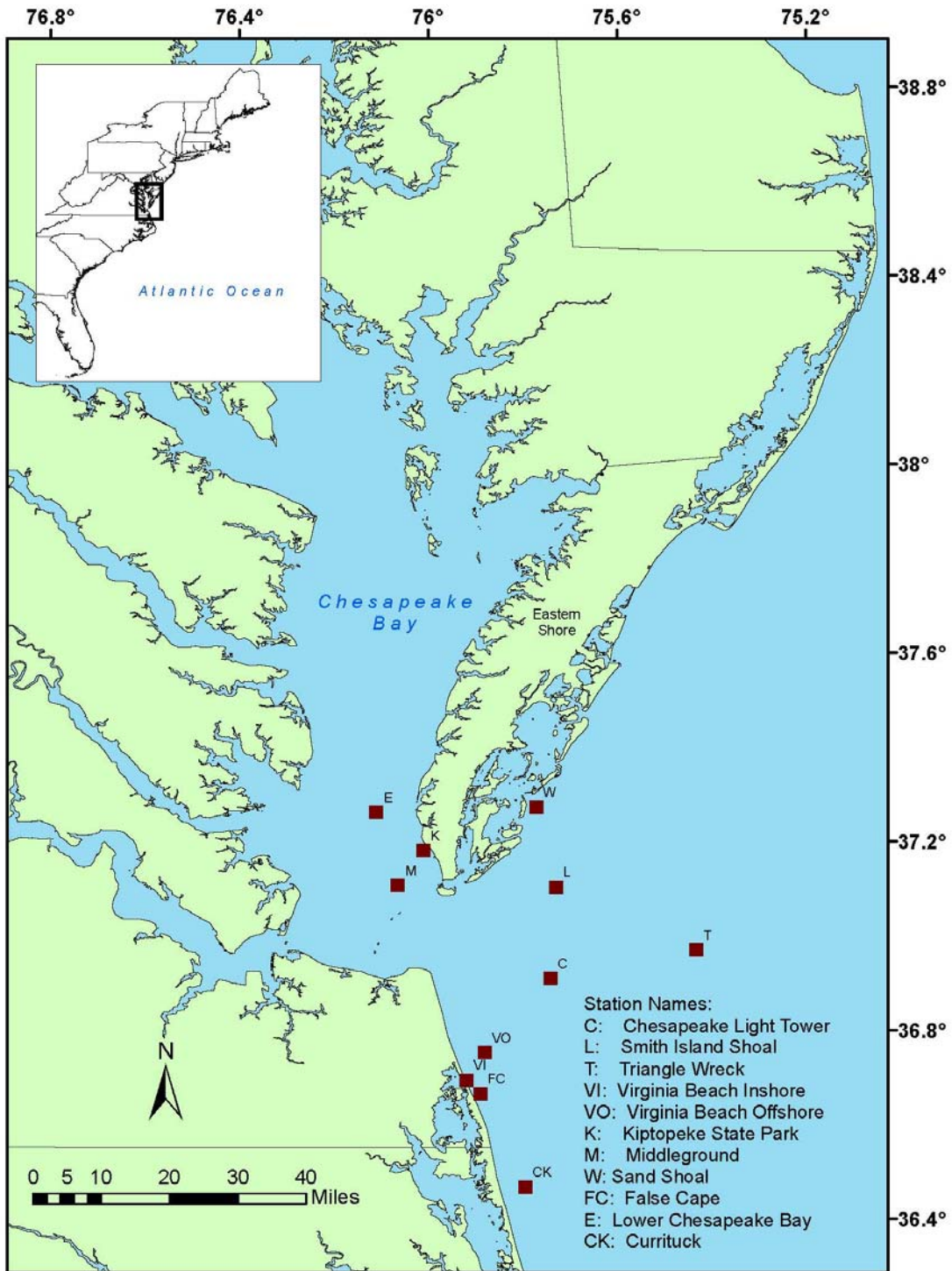


Figure 1. VIMS Elasmobranch Longline Survey stations for cobia bycatch between 1989-2011.

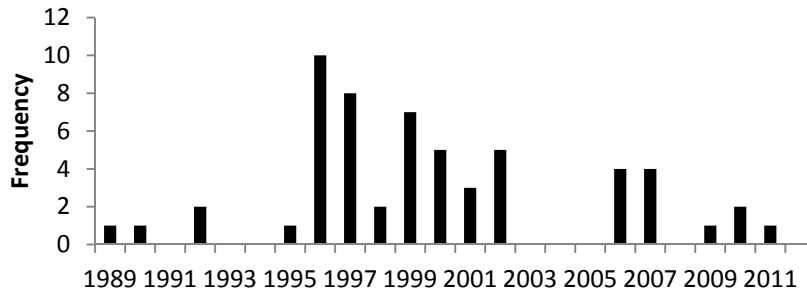


Figure 2. Cobia bycatch frequency on the VIMS Elasmobranch Longline Survey, 1989-2011.

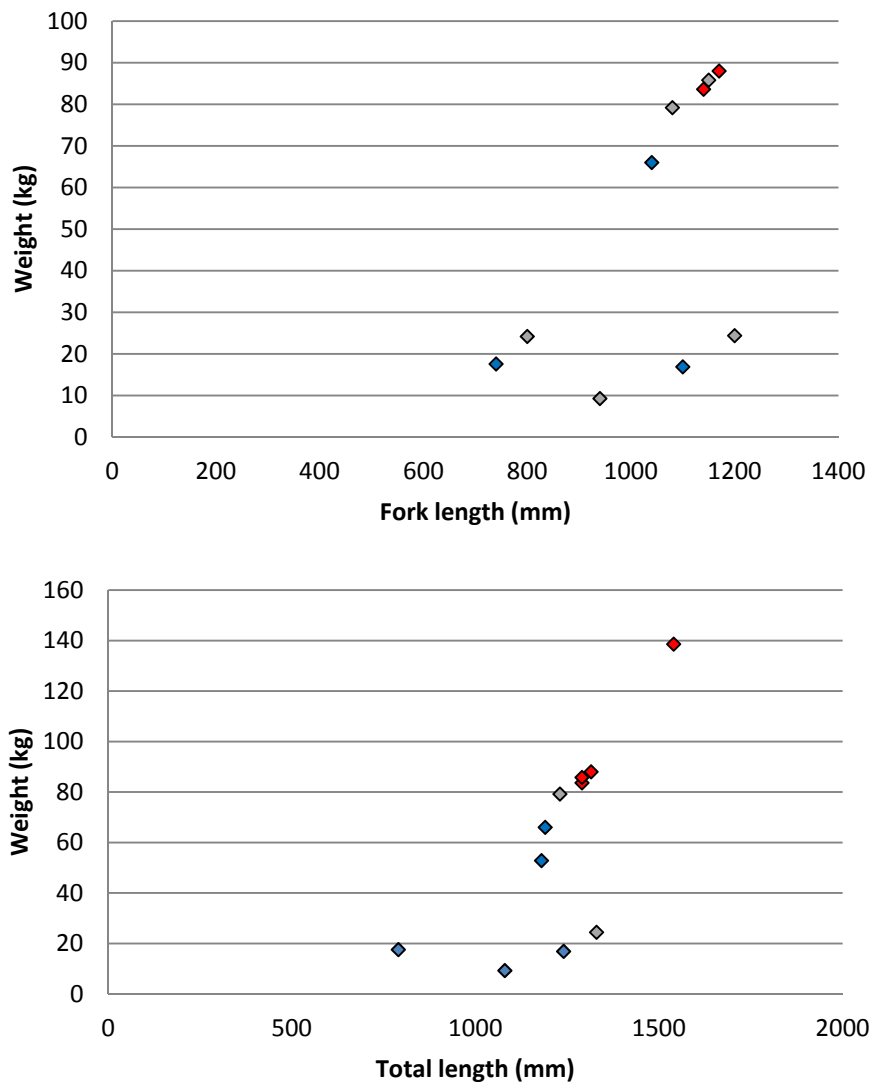


Figure 3. Length-weight relationships for male (blue), female (red), and unknown (grey) cobia bycatch on the VIMS Elasmobranch Longline Survey, 1989-2011.